Claims

1. A decoder comprising:

a first input for receiving one of a plurality of encoded codewords, wherein the one of the plurality of encoded codewords corresponds with one of a plurality of source data words in accordance with a predetermined coding scheme;

a second input for receiving a plurality of candidate codewords, wherein the plurality of candidate codewords is generated by encoding the plurality of source data words in accordance with the predetermined coding scheme;

a comparator coupled to the first and second inputs, the comparator for comparing the one of the plurality of encoded codewords with at least some of the plurality of candidate codewords, and the comparator for producing a latch signal when the one of the plurality of encoded codewords is substantially similar to one of the plurality of candidate codewords, wherein the one of the plurality of candidate codewords is produced by the one of the plurality of source data words; and the comparator having an output coupled to provide the latch signal.

2. A decoder in accordance with claim 1 further comprising a candidate codeword generator coupled to the second input, the candidate codeword generator for generating the plurality of candidate codewords.

3. A decoder in accordance with claim 2, wherein the candidate codeword generator comprises:

a source data word generator for generating each of the plurality of source data words, and for providing each of the plurality of source data words; and

an encoder coupled to the source data word generator, the encoder for receiving the plurality of source data words, the encoder for encoding each of the plurality of source data words in accordance with the predetermined coding scheme to produce the plurality of candidate codewords, and the encoder having an output coupled to the second input for providing the plurality of source data words.

4. A decoder in accordance with claim 3 wherein the encoder comprises a transport format combination indicator (TFCI) encoder, the TFCI encoder for receiving each of a plurality of TFCI source data words, for encoding each of the plurality of TFCI source data words in accordance with a predetermined TFCI coding scheme, and for providing a plurality of candidate TFCI codewords.

5. A decoder in accordance with claim 4 wherein the source data generator comprises a counter for generating each of the plurality of candidate TFCI codewords.

6. A decoder in accordance with claim 5 wherein the counter comprises a sequential counter for providing at least some of the plurality of candidate TFCI codewords in a predetermined sequence.

7. A decoder in accordance with claim 6 wherein the counter has a counter-setting input for receiving predetermined TFCI source data, whereupon receiving the predetermined TFCI source data the counter is set in accordance with the predetermined TFCI source data.

8. A decoder in accordance with claim 1 wherein the decoder further comprises a data latch having a first input coupled to receive the latch signal and having a second input coupled to receive each of a plurality of source data words from the candidate codeword generator, the data latch for storing one of the plurality of source data words when the one

of the plurality of source data words is received contemporaneously with the latch signal.

9. A decoder in accordance with claim 8 wherein the comparator comprises a candidate codeword generator for generating and providing the plurality of source data words.

10. A decoder in accordance with claim 1 wherein the comparator comprises:

a correlator coupled to receive the one of the plurality of encoded codewords and each of the plurality of candidate codewords, the correlator for correlating the one of the plurality of encoded codewords and the each of the plurality of candidate codewords, and the correlator for providing a correlation metric; and

a metric comparator coupled to the correlator for receiving the correlation metric, and for producing the latch signal from the correlation metric.

11. A decoder in accordance with claim 10, wherein the metric comparator comprises a metric comparison circuit having a first input for receiving the correlation metric, and the metric comparison circuit having a second input for receiving a maximum correlation metric measured, and the metric comparison circuit having an output for providing the latch signal when the correlation metric is greater than the maximum correlation metric measured.

12. A decoder in accordance with claim 11, wherein the metric comparator comprises a maximum correlation metric measured memory for storing the maximum correlation metric measured, and wherein the second input of the metric comparison circuit is coupled to the maximum correlation metric measured memory.

13. A decoder comprising:

a first input for receiving one of a plurality of encoded codewords, wherein the one of the plurality of encoded codewords corresponds with one of a plurality of source data words in accordance with a predetermined coding scheme;

a second input for receiving at least some of a plurality of candidate codewords, wherein the at least some of the plurality of candidate codewords is generated by encoding at least some of the plurality of source data words in accordance with the predetermined coding scheme;

a comparator coupled to the first and second inputs, the comparator for comparing the one of the plurality of encoded codewords with the at least some of the plurality of candidate codewords, and the comparator for producing a sign bit and decoded data;

a post processor coupled to receive the sign bit and the decoded data, and the post processor for producing the one of the plurality of source data words; and

an output coupled to provide the one of the plurality of source data words.

14. A decoder in accordance with claim 13 further comprising a candidate codeword generator coupled to the second input, the candidate codeword generator for generating the at least some of the plurality of candidate codewords.

15. A decoder in accordance with claim 14, wherein the candidate codeword generator comprises:

a source data word generator for generating the at least some of the plurality of source data words, and for providing each of the at least some of the plurality of source data words; and

an encoder coupled to the source data word generator, the encoder for receiving the at least some of the plurality of source data

words, the encoder for encoding each of the at least some of the plurality of source data words in accordance with the predetermined coding scheme to produce the at least some of the plurality of candidate codewords, and the encoder having an output coupled to the second input for providing the at least some of the plurality of source data words.

16. A decoder in accordance with claim 15 wherein the encoder comprises a transport format combination indicator (TFCI) encoder, the TFCI encoder for receiving at least some of a plurality of TFCI source data words, for encoding each of the at least some of the plurality of TFCI source data words in accordance with a predetermined TFCI coding scheme, and for providing at least some of the plurality of candidate TFCI codewords.

17. A decoder in accordance with claim 15 wherein the source data word generator comprises a counter for generating at least some of the plurality of candidate TFCI codewords.

18. A decoder in accordance with claim 17 wherein the counter comprises a sequential counter for providing at least some of the plurality of candidate TFCI codewords in a predetermined sequence.

19. A decoder in accordance with claim 17 wherein the counter has a counter-setting input for receiving predetermined TFCI source data, whereupon receiving the predetermined TFCI source data the counter is set in accordance with the predetermined TFCI source data.

20. A decoder in accordance with claim 15 wherein the comparator comprises:

a correlator coupled to receive the one of the plurality of encoded codewords and at least some of the plurality of candidate codewords,

the correlator for correlating the one of the plurality of encoded codewords and each of the at least some of the plurality of candidate codewords, and the correlator for providing a correlation metric; and

a magnitude comparator coupled to the correlator for receiving the correlation metric, and for producing the sign bit and the decoded data.

21. A decoder in accordance with claim 20 wherein the magnitude comparator comprises:

a magnitude comparison circuit having a first input for receiving the correlation metric, the magnitude comparison circuit having a second input for receiving a maximum magnitude measured, and the magnitude comparison circuit having an output for providing a latch signal when the magnitude of the correlation metric is greater than the maximum magnitude measured; and

a decoded data memory coupled to receive the at least some of the plurality of source data words and having an input for receiving the latch signal, the decoded data memory for storing one of the at least some of the plurality of source data words as the decoded data when the latch signal is received, and the decoded data memory having an output for providing the decoded data.

22. A decoder in accordance with claim 21 wherein the magnitude comparator further comprises:

a sign bit memory coupled to receive the correlation metric and the latch signal, the sign bit memory for storing the sign bit of the correlation metric therein when the magnitude of the correlation metric is greater than the maximum magnitude measured, and the sign bit memory having an output for providing the sign bit.

23. A method for decoding comprising the steps of:

a) receiving one of a plurality of encoded codewords, wherein the one of the plurality of encoded codewords corresponds with one of a plurality of source data words in accordance with a predetermined coding scheme;

b) generating a plurality of candidate codewords, wherein the plurality of candidate codewords is generated by encoding each of the plurality of source data words in accordance with the predetermined coding scheme;

c) comparing the one of the plurality of encoded codewords with each of the plurality of candidate codewords to determine a measure of similarity therebetween;

d) determining one of the plurality of candidate codewords has the greatest measure of similarity;

e) identifying the corresponding one of the plurality of source data words that produced the one of the plurality of candidate codewords in accordance with the predetermined coding scheme; and

f) providing the one of the plurality of source data words.

24. A method in accordance with claim 23, wherein step (a) comprises the step of receiving one of a plurality of encoded TFCI codewords, wherein the one of the plurality of encoded TFCI codewords corresponds with one of a plurality of TFCI source data words in accordance with a predetermined coding scheme.

25. A method in accordance with claim 24, wherein step (b) comprises the steps of:

generating each of the plurality of TFCI source data words; and

encoding each of the plurality of TFCI source data words in accordance with the predetermined coding scheme to produce a plurality of candidate TFCI codewords.

26. A method in accordance with claim 25, wherein step (c) comprises the step correlating the one of the plurality of encoded TFCI codewords with each of the plurality of candidate TFCI codewords to determine a corresponding plurality of correlation metrics associated with each of the plurality of candidate TFCI codewords.

27. A method in accordance with claim 26, wherein step (d) comprises the step determining one of the plurality of correlation metrics associated with one of the plurality of candidate TFCI codewords indicates the greatest measure of correlation.

28. A method in accordance with claim 27, wherein step (e) comprises the step of identifying the one of the plurality of TFCI source data words that produced the one of the plurality of candidate TFCI codewords, wherein the one of the plurality of candidate TFCI codewords is associated with the one of the plurality of correlation metrics indicating the greatest measure of correlation.

29. A method in accordance with claim 28, wherein step (f) comprises the step of providing the one of the plurality of TFCI source data words.

30. A method for decoding where a bi-orthogonal coding scheme is employed, the method comprising the steps of:

a) receiving one of a plurality of encoded codewords, wherein the one of the plurality of encoded codewords corresponds with one of a plurality of source data words in accordance with a predetermined coding scheme;

b) generating a plurality of candidate codewords, wherein the plurality of candidate codewords is generated by encoding at least some of a plurality of data words in accordance with the predetermined coding scheme;

c) comparing the one of the plurality of encoded codewords with the at least some of the plurality of candidate codewords to determine a measure of similarity therebetween, wherein the measure of similarity includes a bi-orthogonal state indicator;

d) determining one of the at least some of the plurality of candidate codewords has the greatest measure of similarity;

e) identifying the corresponding one of the plurality of data words that produced the one of the plurality of candidate codewords in accordance with the predetermined coding scheme;

f) determining the state of the bi-orthogonal state indicator;

g) when the bi-orthogonal state indicator has a first state, the corresponding one of the plurality of data words is provided as the one of the plurality of source data words; and

f) when the bi-orthogonal state indicator has a second state, a correlation offset value is added to the corresponding one of the plurality of data words, and the sum is provided as the one of the plurality of source data words.

31. A method in accordance with claim 30, wherein step (a) comprises the step of receiving one of a plurality of encoded TFCI codewords, wherein the one of the plurality of encoded TFCI codewords corresponds with one of a plurality of TFCI source data words in accordance with a predetermined coding scheme.

32. A method in accordance with claim 31, wherein step (b) comprises the steps of:

generating at least some of the plurality of data words; and

encoding each of the plurality of data words in accordance with the predetermined coding scheme to produce a plurality of candidate TFCI codewords.

33. A method in accordance with claim 31, wherein step (b) comprises the steps of:

receiving at least some of the plurality of data words; and

encoding each of the plurality of data words in accordance with the predetermined coding scheme to produce a plurality of candidate TFCI codewords.

34. A method in accordance with claim 32, wherein step (c) comprises the step correlating the one of the plurality of encoded TFCI codewords with each of the plurality of candidate TFCI codewords to determine a corresponding plurality of correlation metrics associated with each of the plurality of candidate TFCI codewords.

35. A method in accordance with claim 34, wherein step (d) comprises the step determining one of the plurality of correlation metrics associated with one of the plurality of candidate TFCI codewords indicates the greatest measure of correlation.

36. A method in accordance with claim 35, wherein step (e) comprises the step of identifying the one of the plurality of data words that produced the one of the plurality of candidate TFCI codewords, wherein the one of the plurality of candidate TFCI codewords is associated with the one of the plurality of correlation metrics indicating the greatest measure of correlation.

37. A method in accordance with claim 36, wherein step (f) comprises the step of using the one of the plurality of data words and the state of the bi-orthogonal state indicator to determine the one of the plurality of TFCI source data words.